Identity numbers

Identity numbers are numbers that don't change the "identity" of the original value.

The identity for **addition** is 0.

The identity for **multiplication** is 1.

The reason is that

You can **add** 0 to any number and it doesn't change the original value.

You can **multiply** any number by 1 and it doesn't change the original value.

Example

What is $17 + 0$?

Without even thinking about this in terms of identity numbers, we should already know that $17 + 0 = 17$, because if you have 17 and you add nothing to it, you still have 17.

If we think about this more technically in terms of identity numbers, we know that 0 is the identity number for addition. Since we are adding 0, and because 0 is the identity number for addition, we know that adding 0 to 17 won't change the identity of 17, so $17 + 0$ will just be 17.

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Let's look at an example with the identity number for multiplication.

Example

What is 4×1?

In this problem we're multiplying 4 by 1. We should already know that 4 times 1 is just 4, and we don't really need identity numbers to tell us this.

But the identity number concept confirms that this is true. We know that 1 is the identity number for multiplication. Since we are multiplying by 1, and because 1 is the identity number for multiplication, we know that multiplying 4 by 1 won't change the identity of 4, so 4×1 will just be 4.

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